

EXECUTIVE SUMMARY

National Shoreline Erosion Control Development and Demonstration Program Discussion, December 9-10, 1999, US Army Engineer Research and Development Center, Vicksburg, MS

Introduction

This report documents the discussion pertaining to initiation of the National Shoreline Erosion Control Development and Demonstration Program (herein referred to as "Program") on December 9-10, 1999 at the US Army Engineer Research and Development Center's (ERDC) Coastal and Hydraulics Laboratory (CHL) by the Program committee members. The Program committee members ("Committee") consist of a sub-committee of the civilian members of the Coastal Engineering Research Board (CERB) (Drs. Robert Dean, Billy Edge, and Richard Sternberg), HQUSACE (Mr. Charles Chesnut), and CHL personnel (Ms. Joan Pope, Program Manager, and Messrs. William Curtis and George Turk, Principal Investigators). The CERB sub-committee was appointed by the Deputy Commanding General for Civil Works to act in an expert advisory position for Program implementation and coordination.

The purpose of the meeting was to discuss US Army Corps of Engineers (USACE) implementation of the National Shoreline Erosion Control Development and Demonstration Program authorized under Section 227 of the Water Resources Development Act of 1996 (WRDA'96). During the course of discussion, the Committee reviewed language of Section 227 and discussed related topics including development of a program statement of purpose, program management, demonstration site and application selection criteria, demonstration project monitoring, and technology transfer.

This report presents a general overview of Committee discussion. In addition to the general overview are three appendices that provide more detailed information. Appendix A presents the WRDA '96 legislative authorization of the National Shoreline Erosion Control Development and Demonstration Program. Appendix B presents a draft Statement of Purpose developed by the Committee. For the reader's benefit, acronym and abbreviations used in this report are defined in Appendix C.

Program Authorization (Section 227)

Section 227 of WRDA'96 provides authorization by which innovative shore protection devices, designs, and methods can be constructed, monitored and evaluated for functional performance and structural integrity. Specifically, the legislation authorizes establishment of the National Shoreline Erosion Development and Demonstration Program to be established and executed by the Secretary of the Army. The Committee will serve to oversee successful execution of the Program on behalf of the Secretary of the Army. The Committee reviewed the legislation presented in Appendix A and interpreted the authorizing language in a manner that will best serve national coastal erosion protection interests.

Program Statement of Purpose

As the first step towards program development, the Committee defined a Statement of Purpose for the National Shoreline Erosion Control Development Program. This Statement of Purpose reflects the Committee's interpretation of Section 227 authorizing language. The objectives of the Program are to: a) assess and advance the state of the

art of shoreline erosion control technology, b) develop and encourage the development of innovative solutions to the shoreline erosion control challenge by using the Program's authority to demonstrate and evaluate the effectiveness of various devices/methods in both laboratory and field environments, and c) communicate findings to the public, state, and local officials and develop means for furthering the use of well-engineered alternative approaches to shoreline erosion control.

The draft Statement of Purpose is presented in Appendix B and outlines the specific objectives of the Program. In addition, the Committee recommended a course of action for accomplishing the objectives. The Program will emphasize the advancement of the state of the art of coastal erosion control technology from both functional and structural perspectives and will include bio-engineered (i.e., vegetative) approaches. Technological advancements will be selected for application and demonstration based on scientific and engineering validity, economics, and professional consultation by the CERB civilian sub-committee and others as deemed appropriate. The functional performance of technology applied under the Program will be evaluated as related to interaction with the coastal system and other engineering considerations such as constructability, structural stability and life-cycle cost. Evaluation of functional performance will be documented and widely disseminated to the coastal engineering community under the technology transfer element of the Program.

The Program will support three levels of investigation: a) planning, design, construction, monitoring and evaluation of innovative shoreline protection applications at demonstration sites, b) monitoring and quantitative evaluation of existing or non-Program sponsored innovative applications (i.e., projects of opportunity), and c) evaluation and documentation of existing or previously existing innovative applications.

Differences between Section 54 of the 1970's and present Section 227 Program

The Shoreline Erosion Control Demonstration Act of 1974, Section 54, authorized the establishment and execution of a 5-year "low-cost" shoreline erosion protection demonstration program. The objective of Section 54 was to plan, design and construct, monitor and evaluate innovative low-cost methods to abate coastal shoreline erosion in low or moderate wave energy environments. Section 227 differs from Section 54 in that the focus of Section 227 is not specifically on low-cost shoreline protection alternatives and on low energetic environments. Rather, Section 227 is more general in the scope of technological advancements to be demonstrated and in the criteria for demonstration project site selection. In addition, Section 54 was strictly a demonstration authorization, whereas Section 227 is authorized as a development and demonstration program. Results of the Section 54 program were reviewed to gain insight to related management and technological issues associated with Section 227.

Selection Criteria

An important outcome of the Committee discussion was the establishment of demonstration site selection criteria, device/method selection criteria, and evaluation/monitoring criteria. General guidance for demonstration site selection criteria was presented in the Section 227 authorization. In addition to criteria mandated by the legislation (refer to Appendix A), the Committee included other criteria based on experience gained from the Section 54 program. Demonstration sites under Section 227 shall: a) be experiencing shoreline erosion at a manageable rate, b) have a length of shoreline to sufficiently demonstrate the functional performance of applied technology, c)

have suitable control sections or pre-project monitoring records, d) have identifiable spatial and temporal scales associated with localized coastal processes, and e) have a local cooperating partner that will assume life-cycle responsibility of the project beyond the authorized length of the Program.

The Committee developed selection criteria for shoreline erosion devices or methods to be applied. These criteria include: a) applicability of technology to demonstration site, b) suitable and quantifiable functional performance prediction metrics, c) sound engineering design, d) economic feasibility of construction and maintenance, and e) meets local permitting and regulatory requirements. Specific monitoring criteria will be developed to suit the individual demonstration project. General monitoring criteria include evaluation of: a) control areas or pre-project baseline data, b) application with regard to event-related and long-term functional performance projection and structural stability, c) environmental impacts (if applicable), and d) local hydrodynamic and sediment transport processes.

Program Funding

Section 227 is authorized for \$21,000,000 of funding over six years. For FY00, \$1,250,00 has been appropriated out of the existing USACE GI R&D program to initiate Section 227 activities and to develop a demonstration project in the state of New Jersey. An additional \$1,000,000 may be appropriated for FY00 activities to expedite Program objectives. It is expected that appropriations on the order of \$6,380,000, \$6,370,000, \$2,330,000, \$2,330,000 and \$2,330,000 will be required to support respective FY01, FY02, FY03, FY04 and FY05 activities and to continue the Program as authorized. Appropriations are large during FY03 and FY02 to accommodate design and construction of demonstration projects. Subsequent FY appropriations will be used to monitor, evaluate and document individual project performance.

The authorizing language of Section 227 states that a minimum of seven demonstration projects will be constructed on various coastlines. The Program alone cannot support all elements of each selected demonstration project (i.e., planning, design, construction, monitoring and evaluation). Therefore, it is expected that that Program will leverage cost sharing with local sponsors and existing or authorized USAED coastal projects that meet Program criteria.

Program Coordination

The Committee scheduled a meeting, to formally brief USAE District and Division coastal personnel on the demonstration program, for January 27, 1999. The meeting will provide an overview of the Program and its Statement of Purpose. In addition, the Committee will solicit information from USAED personnel pertaining to potential demonstration sites and projects of opportunity, local sponsorship, regulatory and permitting issues, contracting procedures, and the demonstration site/application nomination process.

Appendix A

[Authorizing Language of the National Shoreline Erosion Control Development and Demonstration Program](#)

Appendix B

DRAFT Statement of Purpose for National Shoreline Erosion Control Development and Demonstration Program

- I. Statement of Purpose
 - a. Assess and advance the state of the art of beach erosion control technology.
 - b. Develop and encourage the development of innovative solutions to the beach erosion control challenge and to use the program's authority to demonstrate and evaluate the effectiveness of various devices/methods in both laboratory and field environments.
 - c. Communicate findings to the public, state, and local officials and develop means for furthering the use of well-engineered alternative approaches to beach erosion control.
- II. The objectives of the National Shoreline Erosion Control Development and Demonstration Program will be accomplished as follows:
 - a. Information needs for project consideration. To be considered as a candidate, a project proposal must include the following information and characteristics:
 1. A detailed description of the project elements including their installation requirements for adequate testing and scale drawings showing the installed system.
 2. Information to allow detailed evaluation of the manner in which the elements of the project are expected to function.
 3. A description of the physical mechanisms which accomplish the project's objectives.
 4. Claims of the project's effectiveness including timing of predicted changes.
 5. Any other background material which the proposer believes to be useful in evaluating the proposal. These may include any existing reports of laboratory or earlier field studies, evaluation by qualified experts, etc.
 6. Recommended Monitoring plan to evaluate "a-4."
 - b. Evaluation of individual projects will be based on the following

criteria:

1. The establishment of a demonstrable and quantifiable basis in terms of physical processes, which justifies the performance claims in "a-4."
2. Life-cycle cost comparisons with other methods that will accomplish the same objectives.
3. The evaluation will be carried out by the three civilian members of the Coastal Engineering Research Board (CERB) augmented by additional experts deemed appropriate by the CERB.

Appendix C

Acronyms and Abbreviations

CHL	Coastal and Hydraulics Laboratory
Committee	Section 227 Sub-Committee
ERDC	US Army Engineer Research and Development Center
FY00	Fiscal Year 2000
HQUSACE	Head Quarters, US Army Corps of Engineers
GI	General Investigation
Program	National Shoreline Erosion Control Development and Demonstration Program
R&D	Research and Development
Section 54	Section 54 of the Water resources Development Act of 1977
Section 227	Section 227 of the Water Resources and Development Act of 1996
USACE	US Army Corps of Engineers
WRDA'96	Water Resources and Development Act of 1996